Drug abuse and oral health: the ecstasy and the agony

Group 5.6 01/02

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1. ABSTRACT

Objectives: To report on oral health experiences and clinical oral health status of a young adult (aged 25 or younger) population in drug rehabilitation. In addition, to identify associations between type of drug abused ('ecstasy' (MDMA) Vs non-ecstasy abusers) and oral health. Methods: Adolescents and young adults (aged 25 or younger) 'living in' drug rehabilitation centres in Hong Kong were invited to participate in the study. Participants self-completed a questionnaire and underwent clinical examination. Results: One hundred and nineteen drug addicts completed the study. Most reported oral health experiences during and after drug abuse ('trips') such as dryness of their mouth (95%, 113), having to chew something (75%, 89), felt tenderness around their tempromandibular joint (56%, 66) and reported clenching and grinding their teeth (52%, 62). Many reported cravings for 'sugary' food substances (75%, 89), drinking 'fizzy' drinks (58%, 69) and chewing gum (56%, 67) after drug abuse. Dental caries experience was high (mean DMFT 3.81, SD 4.54) and there was a high level of untreated decay (mean D 1.88, SD 3.40). Many too had experience of tooth wear, 48% (48) had evidence of loss of tooth substance involving dentine or pulp. Tooth wear was more common on posterior rather than anterior teeth. Types of drugs abused were associated with oral health experiences and clinical oral health status. 'Ecstasy' (MDMA) abusers more frequently reported chewing ($P<0.001$), grinding ($P<0.001$), and TMJ tenderness ($P<0.001$) compared to non-ecstasy abusers. In addition, ecstasy abusers had greater signs of tooth wear overall ($P<0.001$) and particularly among molar ($P<0.001$) and premolar teeth ($P=0.005$) abusers compared to non-ecstasy abusers. Caries experience was high among non-ecstasy abusers compared to ecstasy abusers ($P<0.001$). Conclusion: Drug abuse 'produces' many oral health experiences and is associated with clinical oral health status. Types of drugs abused are associated with oral health.

2. INTRODUCTION

Hong Kong and Mainland China has had a long history of drug abuse (the taking of chemical substances without proper medical guidance) that dates back to the opium wars[1]. Heroin smoking originated in Shanghai in the 1920's and involved the use of porcelain bowls and bamboo tubes and spread to Hong Kong soon after. *'Chasing the dragon'*, a refinement of the heroin smoking process, involves inhaling the vapors which result when the drug is heated, typically on tin-foil above a flame. This method of drug ingestion is though to have originated in or near Hong Kong in the 1950s, and spread rapidly to other South East Asia countries, the Indian sub continent and Europe in the 1960's and 1970's.

The major drug issues in the past two decade in Hong Kong has been the rising levels of drug use among young people, with a significant increase in number of teenagers entering drug rehabilitation programme[2]. There has also been an increasing popularity in the use of psychoactive drugs among young drug abusers[3]. In particular there has been growing concern about the use of amphetamine based drugs, notably, 3,4-Methylenedioxymethamphetine, MDMA; commonly known as *'ecstasy'*, *'e'* or *'XTC'*.

'Ecstasy' (MDMA) originated as a diet suppressant but the effects the drug produced: profoundly positive feelings, empathy for others, elimination of anxiety, extreme relaxation and suppression of the need to eat, drink or sleep made it popular in *'raves'* (all-night dance parties) across America and Europe in the 1980's and 1990's.

The Central Registry of Drug Abuse (CRDA) of the Narcotics Division, of Hong Kong Government produced evidence of 'Ecstasy' (MDMA) use in Hong Kong as early as

1996[4]. Between 1999 and 2000 there was 600% increase in the use/abuse of 'Ecstasy' (MDMA), and in 2000, one in seven drug abuse cases were 'Ecstasy' (MDMA) related. 'Ecstasy' (MDMA) had spread East.

Concerns about the effects of 'Ecstasy' on the general health continue to emerge in the medical literature[5]. 'Ecstasy' (MDMA) is known to cause short and long term ill health effects and can be fatal. In the short term, it may cause extreme dehydration or exhaustion, nausea, hallucinations, chills, sweating, increase in body temperature, tremors, muscle cramping and blurred vision[6]. There are also after-effects, which include anxiety, paranoia and depression. The long term effects of abusing 'Ecstasy' (MDMA) is the risk of developing permanent brain damage that may manifest as depression, anxiety, memory loss and various neuropsychotic disorders[7]. In some cases it can result in death by various means: malignant hyperthermia, internal bleeding, fatal overdosing and through allergic reactions[8].

Little is known about the oral health effects of 'Ecstasy' (MDMA), the oral health sensations it produces (in the short term) and the long-term effects it may have on oral health status. Our community health project hoped to shed some light on this matter.

3. AIM

This study aimed to determine the oral health status of adolescents and young adults (<25-years-olds) in drug rehabilitation in Hong Kong SAR, China. To describe self-reported oral health experiences of the drugs abusers during and after drug abuse (*'trips'*). In addition, to identify associations between types of drugs abused, self-reported oral health experiences, and clinical oral health status.

The objectives were:

1. to collect information about the types of drugs abused by the addicts and pattern of drug abuse,

2. to collect information about their reported oral health experiences during and after the *'trips'*,

3. to assess their clinical oral health status: primarily dental decay experience (DMFT), and tooth wear.

4. to identify variations in self-reported oral health experiences and clinical oral health status in relation to drug abuse patterns.

4. METHODS AND MATERIALS

4.1 Sample

After much consideration by the group on how to recruit drug abusers (particularly abusers of 'Ecstasy') given the difficulty in identifying abusers from the population as a whole and problems of compliance and cooperation among drug abusing population, it was decided to try and access drug abusers in rehabilitation programmes, a 'captive' population. The Hong Kong Government's Social Welfare Department was contacted and asked about the various rehabilitation programmes throughout the territory. From that list (the sampling frame) all centres were contacted to determine the profile of the drug rehabilitation clients (age) and type of centre (home stay versus 'drop in'). Rehabilitation centres that had young adults staying there, were invited to participate in the project. Details of the project aims and proposed methods were sent to rehabilitation centres for their management committee to review and discuss with the young addicts. Four centres agreed to participate (Caritas Wong Yiu Nam Centre in Sai Kung, The Christian New being Fellowship in Sai Kung, Christian Zheng Sheng Association in Lantau, Wu Oi Christian Centre in Lantau).

4.2 Data collection

The data collection consisted of two parts; a self-completed questionnaire and a clinical oral examination.

4.2.1 Questionnaire

A questionnaire was developed to assess (a) previous drug abuse: types of drugs abused, pattern of drug abuse and period of drug abuse, (b) self-reported oral health experiences during and after drug abuse.

Questionnaire format

A self-administered type of questionnaire was chosen over a face-to-face interview because it offered an opportunity for confidential and/or embarrassing questions to be asked without the pressure of respondents having to face the interviewer and thus helped to eliminate the risk of interviewer bias. Moreover, because of the subject matter, a concern was that participants would not volunteer or admit that they used certain drugs or give false responses in order to present a more positive image (social desirability) if interviewed. Furthermore, from the groups (students) perspective, self-administered questionnaire were considered an easier to collect information and more economical of time and resources than interviews. However, the group had concerns that self-administered questionnaires might produce higher non-response rates to questionnaires (or specific items) and required subjects to be literate. To overcome this problem, participants' questionnaires were checked for completeness prior to their oral examination and assistance provided where necessary (clarify questions etc.).

The question format chosen was closed question type, to enable simpler and quicker data collection, and easier analysis of responses. For some responses open-ended questions were used because all possible replies to questions were unknown and to reduce risk of forcing respondents to fill in inappropriate categories.

The questionnaire was designed to cover three main areas. The first part consisted of screening questions that would allow unsuitable respondents to be screened out. The second part focused on the types, habits or frequency of drug use. The last part concentrates on the particular oral related symptoms that the drug abusers may have experienced after taking the drugs in the short and long term, during '*trips*'.

Item selection and content validity

Items for the questionnaire were chosen following a review of the literature on oral health and drug/ substance abuse and an inspection of recent review papers on the immediate, short term and long term medical effects of drug abuse. The questionnaire was piloted for clarity (yes/no) and relevance (low/medium/high) among a small group of known drug abusers, either patients or associates of the group whose views were solicited. Participants in the pilot study were encouraged to express their views on oral health experiences that they had after using drugs to ensure content validity of the questionnaire. Final revisions were made to the questionnaire regarding the order of questions following the pilot study.

Translation

The questionnaire was originally designed, written and piloted tested in English. A forward and backward translation process[9] was used to ensure a valid colloquial

Cantonese Chinese version of the questionnaire. The questionnaire was first forward translated into Chinese by a group of native Chinese speakers. Then the Chinese version of the questionnaire was translated back into English by a separate group of people who can read and write both Chinese and English. Finally, the back-translated English version was compared with the original English version to identity problematic items and these issues were rectified. A final forward-translated Chinese questionnaire version was produced.

4.2.2 Clinical oral examination

The clinical examination focused on two specific aspects of oral health status dental caries experience and tooth wear. Some information was also collected about temporomandibular joint (TMJ) disorders, oral mucosal lesions and dental trauma. Dental caries experience was assessed using the instruments, examination procedures, and diagnostic criteria recommended by World Health Organization[10]. Numbers of decayed, missing and filled teeth were recorded. Tooth wear was assessed by using the diagnostic criteria of the Tooth Wear Index, *TWI*[11]. In circumstance of doubt about the appropriate score, the decision was made to score low, in order that the severity of tooth wear would not be overestimated.

Training

A brief training manual was produced for the examiners outlining procedures for examination and highlighting agreed criteria for epidemiological assessment. Initial training was provided by the project supervisor (CM) to the clinical 'examiners', recorders and support team of the project at the Primary Care Unit (PCU) of the Prince Philip Dental Hospital. Patients attending PCU were invited to participate in a training programme and over the training session examiners became familiar with agreed assessment criteria.

Calibration

Throughout the study 10% of the participants were reexamined to assess inter- and intra- examiner reliability. Inter examiner reliability and intra examiner reliability was 0.62. and 0.74 respectively, indicating moderate to good agreement.

4.3 Data analysis

Frequency tables were produced to determine the profile of the group, pattern of drug abuse, oral health sensations experienced after drug abuse ('*trips*') and diet behavior. Variations in oral health sensations experienced and diet behaviour between 'Ecstasy' and non-'Ecstasy' abusers was explored employing Chi-square statistics. Mean caries experience (DMFT) and tooth wear index scores (TWI) were calculated. Differences in mean DMFT and TWI between 'Ecstasy' and non-'Ecstasy' abusers was determined employing t-tests (on log transformed data because the data was not 'normally' distributed).

5 RESULTS

5.1 Response rate and profile of the group

All of the one hundred and nineteen young drug addicts at the four centres agreed to participate in the study. The age of participants ranged from 15 to 25 years old with a mean age of twenty (20.36-years old, standard deviation (SD) of 2.52 years) and a median age of 20 (interquartile range 19-years-old, 22-years-old). The majority of the young addicts detained at the centre were men (94%, 112).

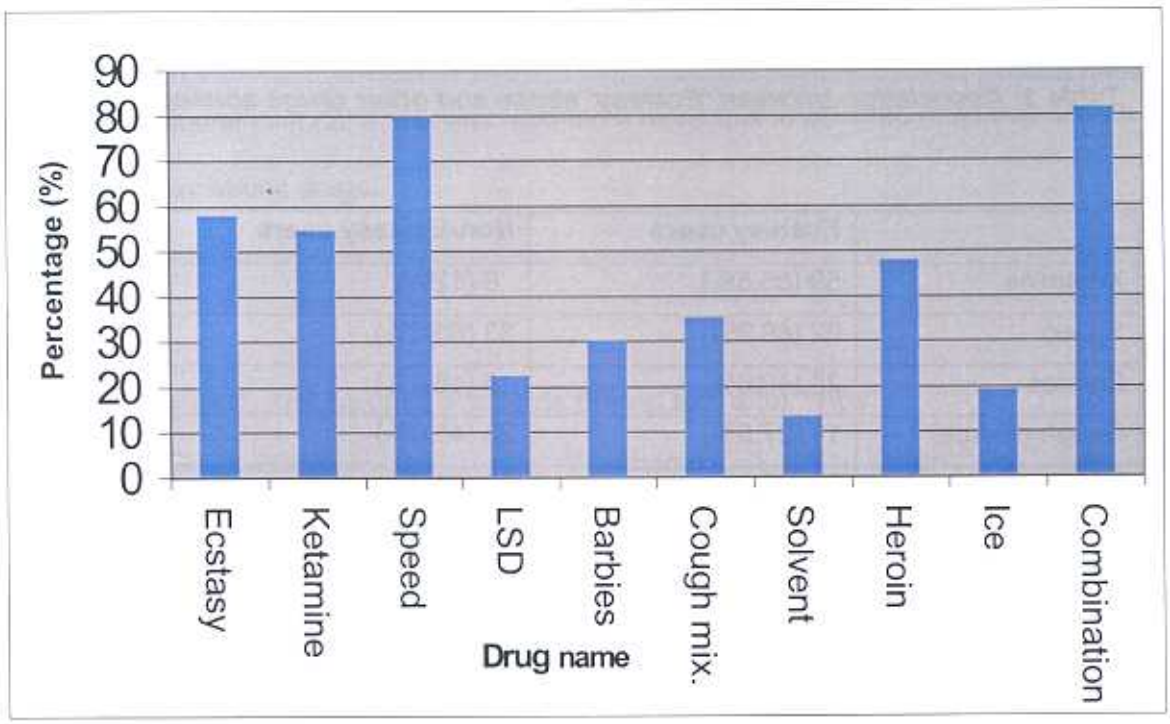
5.2 Patterns of drug abuse

Fifty-eight per cent (69) claimed that they took 'Ecstasy' in the past. However, all of the 'Ecstasy' abusers had also abused some other type of drugs. Among the other types of drug abused, the abuse of another type of amphetamine 'speed' was common 80% (95). Most too had also abused 'ketamine' (55%, 65). Approximately half of the addicts had abused heroin 48% (57). *Figure 1* illustrates the types of drugs abused.

Most claimed they abused drugs more often than once a week (82%, 97) and 10% (12) claimed they abused drugs about as often as once a week. Few claimed they took drugs at intervals greater than once a week; 5% (6) reported taking drugs less than once a week but more than once a month and 3% (4) claimed they only abused drugs about once a month.

The drug abusers claimed that they first started taking drugs at an age ranging from 9 to 22 years of age, with a mean age of starting drugs at 15 (14.90, SD 2.13), median age of 15 (iqr 14, 16).

Figure 1: Types of drugs abused



'Ecstasy' abuse was associated with other type of drug abuse, *Table 2*. Abusers of 'Ecstasy' more frequently claimed they had abused other amphetamine based drugs such as 'speed', *P=0.001* and 'ice', *P=0.008*. In addition, abusers of 'Ecstasy' more frequently reported that had also abused 'ketamine', *P<0.001* and 'barbies' (Barbiturates), *P=0.004*. 'Ecstasy' abusers were less likely to have abused 'heroin', *P=0.003* or 'cough mixtures', *P=0.037*.

There was no significant age or gender difference in 'Ecstasy' abusers compared to non-'Ecstasy' abusers. Abusers of 'Ecstasy' had a mean age of 20.17 (SD 2.49) versus a mean age of 20.62 (SD 2.53) among non-'Ecstasy' abusers, *P=0.342*.

Frequency of abuse of drugs was not associated with whether they were 'Ecstasy' abusers or not, *P=0.401* and was not associated with age that they started abusing drugs *P=0.164*.

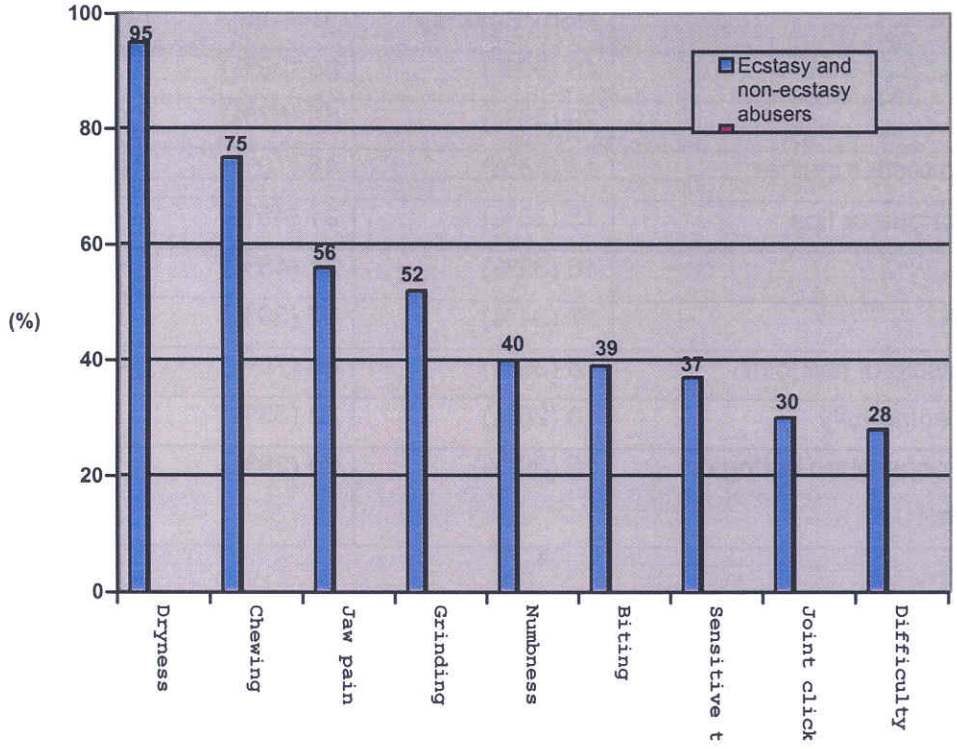
Table 2: Association between 'Ecstasy' abuse and other drugs abused

	Ecstasy users	**Non-Ecstasy users**	**P-value**
Ketamine	59 (85.5%)	6 (12%)	<0.001
Speed	62 (89.9%)	33 (66.0%)	0.001
Barbies	28 (40.6%)	8 (16.0%)	0.004
Cough mixture	19 (27.5%)	23 (46.0%)	0.037
Heroin	25 (36.2%)	32 (64.0%)	0.003
Ice	19 (27.5%)	4 (8.0%)	0.008

5.3 Oral health sensations

After the taking of drugs most experienced a wide range of oral health sensation either during of after 'trips'. Almost all claimed that their mouth 'felt dry' (95%, 113) and three quarters of them felt like 'chewing something' (75%, 89) after abusing drugs. Over half noticed that they had a habit of 'grinding' their teeth (52%, 62) and felt 'tenderness in jaw muscle or jaw joints' (56%, 66) after taking drugs. Over a third felt some sort of 'numbness' in their mouth (40%, 47), felt their 'teeth sensitive' (37%, 44) and had a habit of 'biting their lips or cheeks' (39%, 46). Over a quarter felt a 'clicking' in their tempromandibular joint (29%, 35) and reported a more limited ability to open their mouth (28%, 35) after taking drugs.

Figure 2: oral health sensations during and after 'trips'



5.4 Abuse of ecstasy and oral health sensations

Previous abusers of 'Ecstasy' more frequently claimed they experienced certain oral health sensations compared to those who had never abused 'Ecstasy'. Eighty-seven per cent (60) of 'Ecstasy' abusers claimed they always felt like 'chewing something' after abusing drugs compared to 58% (29) of those who never took 'Ecstasy', *P<0.001*. In addition, 70% (48) of those abused 'Ecstasy' noticed that they had a habit of 'grinding' their teeth after taking drugs compared to 28% (14) of those who never abused 'Ecstasy', *P<0.001*. Also, 70% (48) of those who abused 'Ecstasy' claimed they felt 'tenderness in jaw muscle or jaw joints' compared to 36% (18) non 'Ecstasy' abusers, *P<0.001*. Almost all 'Ecstasy' abusers (99%, 68) reported that their 'mouth felt dry' after taking drugs compared to 90% (45) of non 'Ecstasy' abusers, *P=0.035*.

Table 3: Association between 'Ecstasy' abuse and oral health sensations

	Non-'Ecstasy'	**'Ecstasy'**	**P value**
Dryness	45 (90%)	68 (99%)	0.035
Chewing	29 (58%)	60 (87%)	<0.001
Grind or clamp teeth together	14 (28%)	48 (70%)	<0.001
Bite cheeks, tongue or lips	15 (30%)	31 (45%)	0.099
Numbness	16 (32%)	31 (45%)	0.154
Sensitive teeth	17 (34%)	27 (39%)	0.567
Pain in jaw muscle or jaw joint	18 (36%)	48 (70%)	<0.001
Difficulty in opening fully	10 (20%)	23 (33%)	0.109
Joint clicks or pops when eating or opening mouth	15 (30(%)	20 (29%)	0.905

5.5 Diet behaviour and drug abuse

Many claimed they had dietary cravings after abusing drugs. 74.8% (89) claimed that they drank lots of 'fizzy' drinks, Fifty-eight per cent (69) reported chewing gum after abusing and 56.3% (67) reported that they had craving for 'sweet and sugary food'.

Substances abused were associated with diet behavior. 72.5% (50) of 'Ecstasy' abusers claimed they chewed gum after taking rugs compared to thirty-eight per cent (19) of non-'Ecstasy' abusers, *P<0.001*.

Table 5: Association between 'Ecstasy' abuse and diet behaviour

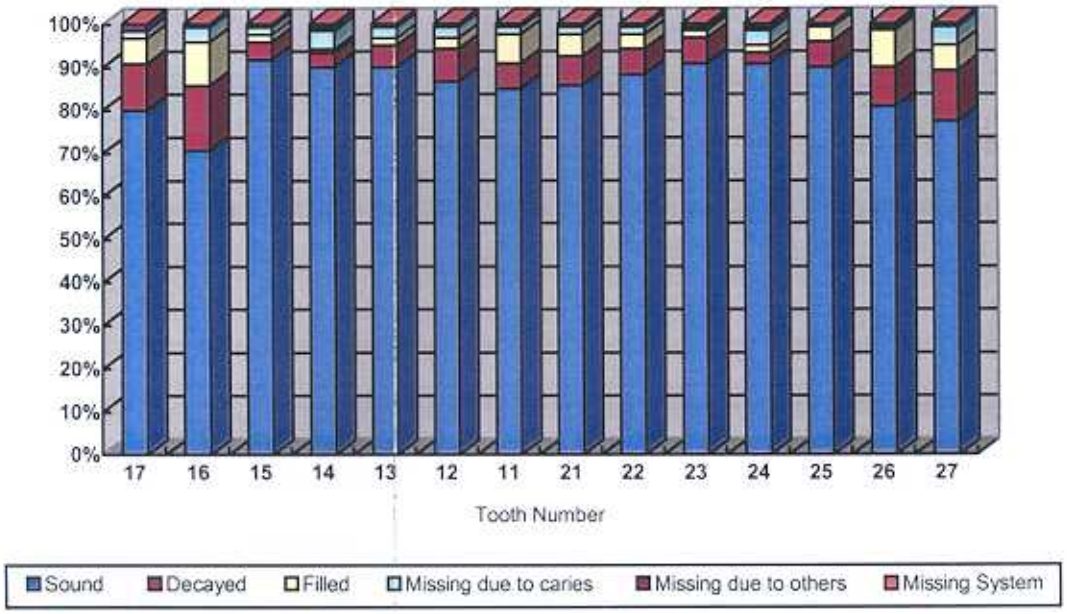
	'Ecstasy' abusers	**Non-'Ecstasy' abusers**	**P-value**
Craving for sugar foods during trips	40(58.0%)	26(52.0%)	0.518
Craving for sugar foods after trips	37(53.6%)	30(60.0%)	0.489
Fizzy drinks during trips	50(72.5%)	37(74.0%)	0.852
Fizzy drinks after trips	52(75.4%)	37(74.0%)	0.866
Chewing gum during trips	48(69.6%)	18(36.0%)	<0.001
Chewing gum after trips	50(72.5%)	19(38.0%)	<0.001

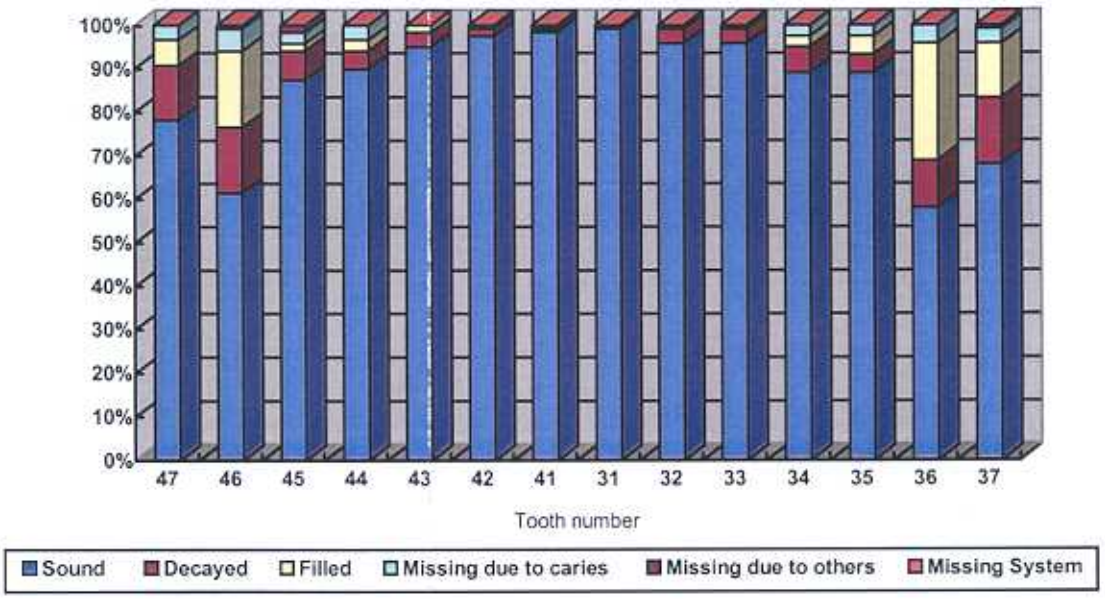
5.6 Dental caries experience: DMFT

Approximately three-quarters of the addicts (74%, 88) had a DMFT of greater than or equal to one. The number of decay missing and filled teeth ranged from 0 to 20, the mean DMFT was 3.81 (SD 4.54), the median 2 (iqr 0, 5).

Forty-four (53) had one or more decay teeth. The number of decayed teeth ranged from 0 to 20, the mean number of decayed teeth (D) was 1.88 (SD 3.40), the median 0 (iqr 0, 2). Approximately half (51%, 61) possessed a filling. The number of filled teeth ranged from 0 to 9, the mean number of filled teeth (F) was 1.31 (SD 1.84), the median 1 (iqr 0, 2). Over a quarter (27%, 32) was missing a tooth. The number of missing teeth ranged from 0 to 15, the mean number of filled teeth (M) was 0.61 (SD 1.68), the median 0 (iqr 0, 1).

Figure 3: Proportion of decayed, missing and filled teeth

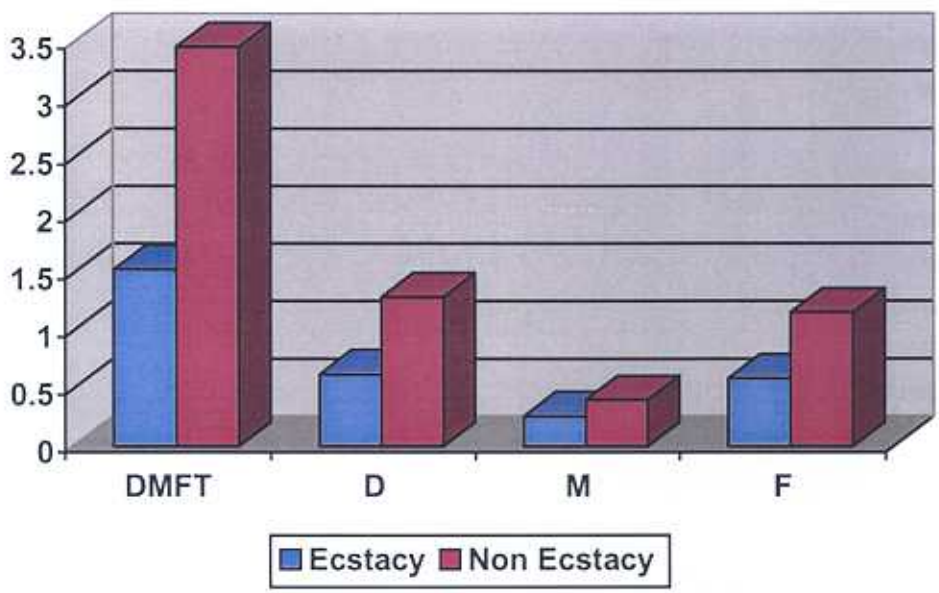




5.7 'Ecstasy' abuse and dental caries experience

Type of drugs abused was associated with dental caries experience. Non-'Ecstasy' abusers had a greater overall caries experience compared to 'Ecstasy' abusers, *P=0.001*, having a greater number of decay teeth, *P=0.033* and a greater number of filled teeth, *P=0.012*.

Figure 4 'Ecstasy' abuse and dental caries experience

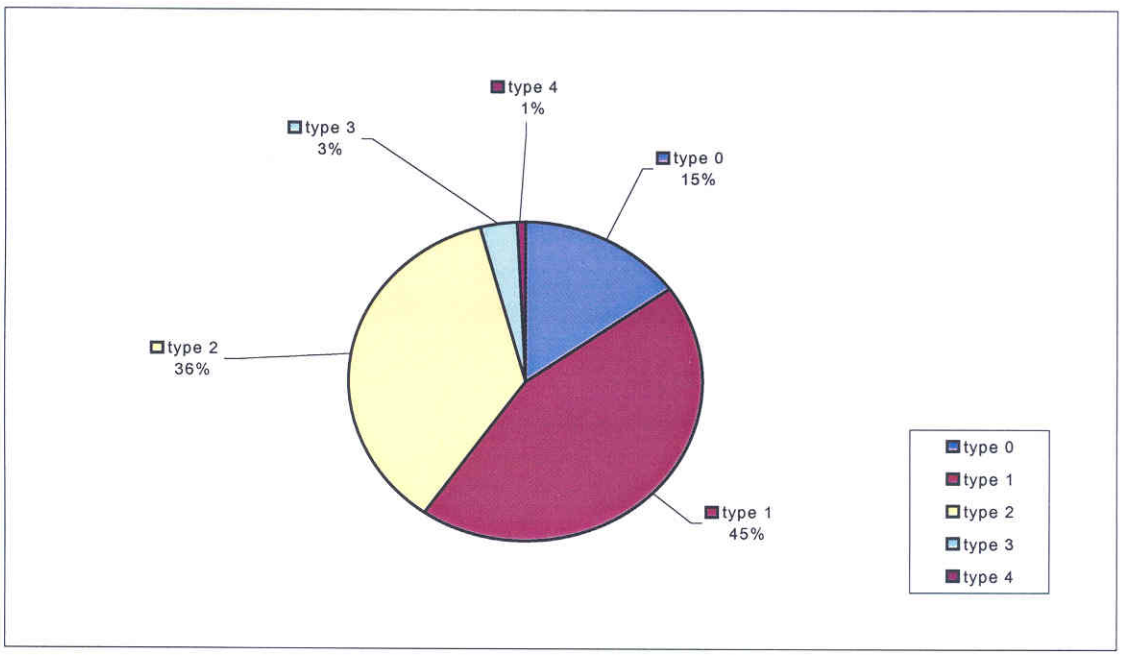


5.8 Tooth wear

5.8.1 Tooth wear prevalence

Most had clinical evidence of tooth wear (85%, 101), with only 15% (18) showing no signs of loss of enamel surface characteristics. The most extensive tooth wear for 45% (53) of the addicts was loss of enamel surface characteristics. Forty per cent (48) had loss of enamel involving dentine or pulp; the most extensive tooth wear thirty-six per cent (53) of the addicts has loss of enamel exposing dentine for less than one-third of tooth surfaces. However, 4 (3%) had loss of enamel exposing dentine for more than one third of the surface and one (1%) had complete loss of tooth surface with pulpal exposure/ involvement.

Figure 5 Extent of tooth wears among the addicts



5.8.2 Pattern of tooth wear

Overall, tooth wear to an extent that had dentine involvement was more common on posterior teeth (premolars and molars) than on anterior teeth (canines or incisors). Approximately equal numbers of right and left posterior teeth (molars and premolars) had tooth wear involving dentine and approximately equal numbers of maxillary and mandibular posterior teeth (molars and premolars) had tooth wear involving dentine. Among anterior teeth (canines and incisors) the extent of tooth wear was less but was similar among maxillary and mandibular anterior teeth.

5.8.3 Mean tooth wear index scores

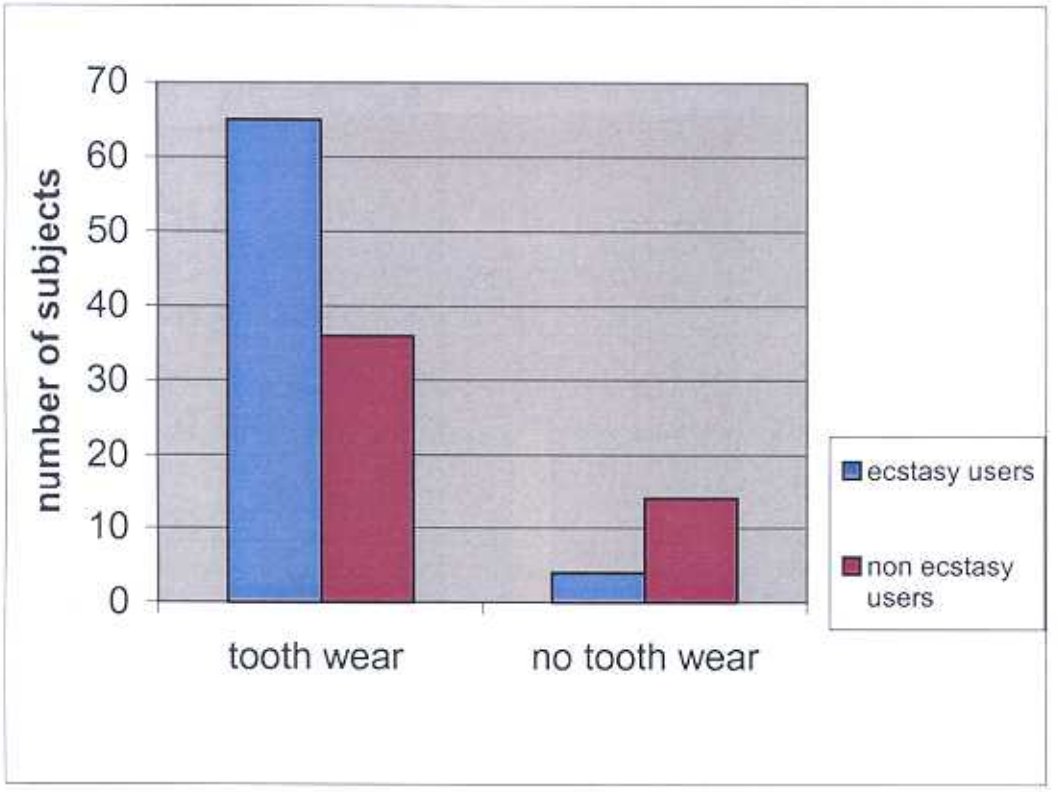
The mean TWI score was 0.38 (SD 0.38). For molar teeth the mean TWI was 0.77 (SD 0.39), for premolars the mean was 0.34 (SD 0.38), for canines 0.35 (SD 0.39), for incisors 0.23 (0.34).

5.8.4 Associations between 'Ecstasy' abuse and tooth wear

5.8.4.1 Extent of tooth wear and 'Ecstasy' abuse

The extent of tooth wear among the addicts was associated with whether they had abused 'Ecstasy' or not, 94% (65) of 'Ecstasy' abusers had evidence of tooth wear compared to 72% (36) of non-'Ecstasy' abusers, *P=0.001*. Approximately half (51%, 35) of the 'Ecstasy' abusers had evidence of tooth wear involving dentine or pulp compared to a quarter (26%, 13) of non-'Ecstasy' abusers, *P=0.007*.

Table 6 Extent of tooth wear and 'Ecstasy' abuse



5.8.4.2 Pattern of tooth wear and 'Ecstasy' abuse

'Ecstasy' abusers more frequently had tooth wear which involved dentine among posterior teeth (molars and premolars) compared to non-'Ecstasy' abusers *P<0.001*.

Table 7 number of subjects with different patterns of tooth wear

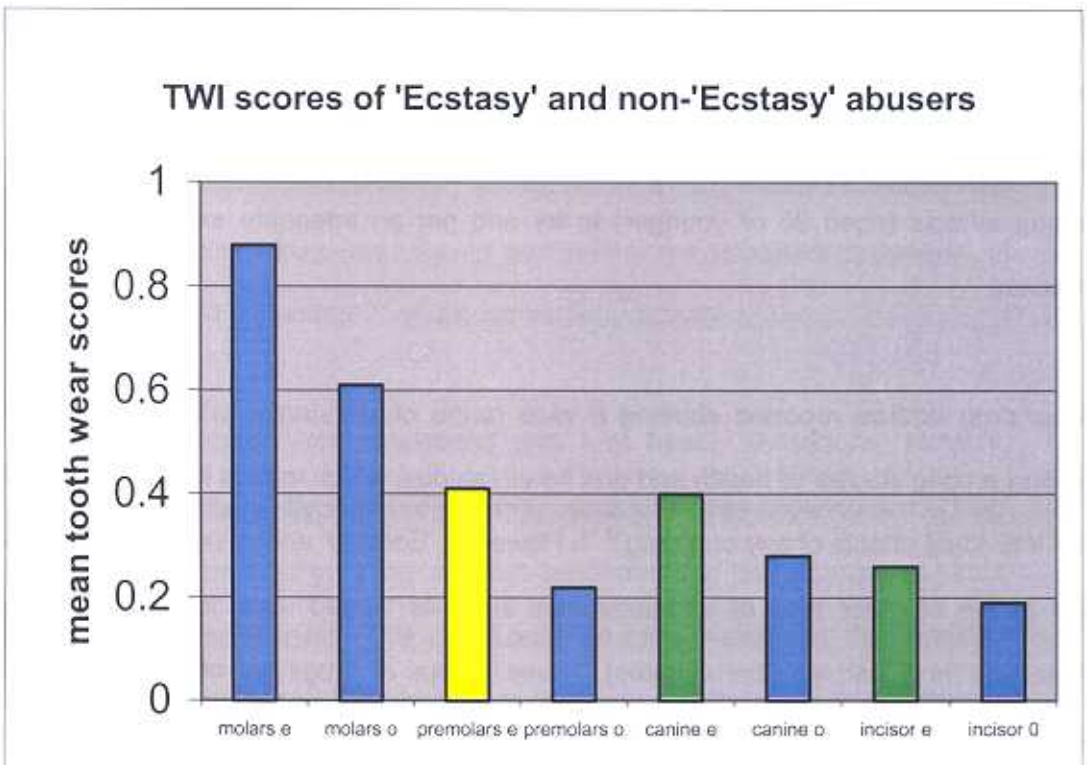
	Maxillary teeth		
group	left posterior	anterior	right posterior
'Ecstasy' abusers	33	10	29
non-'Ecstasy' abusers	6	8	6

	Mandibular teeth		
group	left posterior	anterior	right posterior
'Ecstasy' abusers	33	11	31
non-'Ecstasy' abusers	7	9	7

5.8.4.3 Mean tooth wear index scores and 'Ecstasy' abuse

There were significant differences in overall TWI scores between 'Ecstasy' and non-'Ecstasy' abusers, *P=0.003*. Furthermore, among molar teeth the mean TWI score was greater among 'Ecstasy' abusers compared to non-'Ecstasy' abusers, *P<0.001*. In addition, the mean TWI scores of premolar teeth of 'Ecstasy' abusers was greater than the mean TWI scores of premolar teeth of non-'Ecstasy' abusers, *P=0.005*. The mean TWI score of canine and incisor teeth was marginal greater among 'Ecstasy' compared to non-'Ecstasy' abusers, although not significantly so, *P>0.05*.

Figure 6 Mean tooth wear index scores of the 'Ecstasy' abusers Vs non-abusers.



6 DISCUSSION

6.1 Response rate and profile of the group

Little work has been undertaken about the oral health effects of drug abuse, and this in part reflects the difficulties in obtaining cooperative participants because of their drug abusing habits or indeed identifying drug abusers among the population as a whole. This project focused on examining the oral health of addicts currently in rehabilitation and this not only overcome the difficulties of identifying past drug abusers but also enabled access to a 'captive' population which facilitated cooperation and a high response rate.

The focus of the project was to determine association between 'Ecstasy' abuse and oral health. 'Ecstasy' is a relatively new drug of abuse in Hong Kong but is being abused at an alarming rate particularly among young people[12] and thus the project focused on young addicts (aged 25 or younger) to try and get an adequate sample of 'Ecstasy' abusers.

Most drug addicts reported abusing a wide range of substance and this is common finding among studies of health and oral health studies which makes it difficult to assess the individual effects of any one drug[13,14]. However, 'Ecstasy' abuse was associated with the abuse of other type of amphetamines such as 'speed' and 'ice', and also with 'ketamine' and 'barbies' (barbiturates). These groups of drugs are often referred to as 'designer drugs' or 'party drugs' and commonly abused by younger people in the 'dance scene' or 'raves'[15,16]. Whereas non-'Ecstasy' abusers more frequently had abused 'heroin' and 'cough mixtures' representing what could be described as a different type of drug to the 'designer drug' abusers.

6.2 Oral health sensations

The addicts reported that they experienced a wide range of oral health sensations after taking drugs. Almost all felt their mouth always 'felt dry' (95%) after taking drugs. The pharmacological effects of illicit drugs on salivary function and as a cause of xerostomia are long recognised[17]. Three quarters had observed that they always felt 'like chewing something' when they took drugs and over a half had noticed that they tended to 'grind' their teeth and felt 'tenderness in jaw muscles or joints' after abusing drugs which would support concerns about para functional and over activity of the tempromandibular joint associated with illicit drug use[18]. Interestingly too, about a quarter reported that after abusing drugs they frequently felt 'clicking' in their tempomandibular joints and felt a more limited ability to open their mouth wide. Again suggestion the association between tempromandibular joint activity and illicit drug abuse. About a third noticed a 'numbness' in their mouth after abusing drugs and this in part reflect the analgesic properties of drugs such as 'heroin' and 'ketamine' [19] or altered sensory activity.

Interestingly, 'Ecstasy' abuse was associated with oral health sensations. Notably, 'Ecstasy' abusers more frequently reported that they always 'felt like chewing something', noticed that they had a 'habit of grinding' and felt 'tenderness in jaw muscles or joints' compared to non-'Ecstasy' abusers. This could possible be explained by the stimulant effects of the amphetamine based 'Ecstasy' drugs that cause an increase in activity and an associated increase in movement of the tempromandibular joint, masticatory muscles and parafunctional tooth movement[20]. Anecdotal concerns have been raised about the oral effects of 'Ecstasy' because of such activity[21].

6.3 Diet behaviour and drug abuse

Many reported dietary cravings after abusing drugs, over three quarters (82%) claimed they drank lots of 'fizzy drinks' after abusing drugs. This may be to counteract the reported 'dry feeling' in their mouths they claimed to experience after drug abuse. The effects of such 'fizzy' drinks particularly if taken in large quantities and frequently is likely to have detrimental effects on oral health because of their associated acidity (pH) which can bring about chemical loss of tooth substance, erosion[22]. Moreover, if such drinks also contain sugars, as often they do, this could have a detrimental effect on dental caries levels[23].

Many too (70%) reported they 'chewed gum' after taking drugs. The chewing of gum is likely to be associated with the reported increased activity of the tempromandibular joint, muscles of mastication and parafunctional dental activity and possibly a sign of such activity. Interestingly, 'Ecstasy' abusers more frequently claimed that they chewed gum after taking drugs than non-'Ecstasy' abusers. This would suggest again heightened activity of the tempromandibular joint complex associated with 'Ecstasy' abuse.

Similarly, a high proportion of addicts reported cravings for 'sweet and sugary' foods after drug abuse. There is much evidence in the literature of cravings for sugary food after drug abuse[24]. The frequent and large intake of non-milk extrinsic sugars is likely to give rise to increased dental caries experience among drug abuser[25].

6.4 Dental caries experience

Most had experience of dental caries, three quarters having had a DMFT of greater than or equal to one. The mean DMFT was close to 4 (3.81, SD 4.54) a somewhat greater caries experience than what has been reported among young adults in the general Hong Kong population[26]. This in part may relate to the effects of drug abuse on caries experience or maybe just a reflection of the underlying social background of the group. Economic and educational factors are long considered important predictor of dental caries experience. In addition, while it recognised that drugs are abused across the broad spectrum of social groups in Hong Kong, there is a social gradient among convicted drug addicts and those in rehabilitation programmes[4].

Almost half had evidence of untreated decay suggesting poor dental service utilisation among the drug addicts. This in part may reflect the effects of drug abuse and addiction and how it leads to addicts neglecting their health[27]. It too could relate to the ability of addicts to access dental services because of underlying economic issues or indeed the dental profession's willingness to accept and treat drug addict patients[28].

Interestingly, non-'Ecstasy' abusers had greater overall caries experience (DMFT) and a greater number of untreated decayed teeth as well as restored (F) teeth. This may reflect underlying difference in the two groups; non-'Ecstasy' abusers more frequently abused heroin and cough mixtures and both of these types of drug abuse are reported to be associated with greater dental caries experience[29]. Moreover, the 'Ecstasy' group more frequently abused the more 'designer' or 'party' drugs such as 'ice' and 'speed' and may reflect differences in underlying socio-economic characteristics of the group and associated caries experience[30].

6.5 Tooth wear

6.5.1 Prevalence of teeth wear

The prevalence of tooth wear was high among the group (85%) although for the majority of them the most extensive types of tooth wear was signs of loss of enamel surface characteristics (45% of cases). That aside, 40% (48) did display evidence of tooth wear that was more extensive involving dentine. However, for the majority of those, the most severe level of tooth wear was loss of enamel exposing dentine for the less than one third of one or more teeth. One did have evidence of pulpal exposure.

Comparisons of tooth wear between different study populations are difficulty because of different approaches to measuring tooth wear[31]. However, the findings do suggest that there was a greater level of tooth wear among the group than among the Hong Kong general population of a similar age.

The underlying aetiology of tooth wear and loss of tooth substances is multifactorial[32]. However, it is likely that the reported high prevalence of 'tooth grinding', 'joint tenderness', 'chewing', 'clicking of jaw joints', 'limited ability to open wide' all relate to high levels of parafunctional activity of the tempromandibular joint complex. This high level of parafunctional activity is likely to contribute to attrition and associated loss of tooth substance. Furthermore, the high prevalence of reported craving and drinking of fizzy drinks may produce erosive effects and further loss of tooth structure.

Interestingly, 'Ecstasy' abusers more frequently had evidence of any tooth wear compared to non-'Ecstasy' abusers. Furthermore, 'Ecstasy' abusers more frequently had tooth wear to what could be interpreted as extensive, with half of the 'Ecstasy'

abusers having tooth wear to a level that exposed underlying dentine compared to only a quarter of non-'Ecstasy' abusers. This may relate to the greater parafunctional activity reported among 'Ecstasy' abusers compared to non-'Ecstasy' abusers such as 'chewing something', 'grinding teeth' and feeling 'tenderness in jaw muscle or joints' and their reports of 'chewing gum' after drug abuse compared to non-'Ecstasy' abusers.

6.5.2 Pattern of tooth wear

The pattern of tooth wear in general was interesting in that a greater proportion of posterior teeth (molars and premolars) had extensive tooth wear (exposing dentine/pulp) than anterior teeth (canines and incisors). However, there was no difference in the pattern of tooth wear between maxillary and mandibular teeth or between right and left teeth. This pattern of tooth wear may be related to the associated parafunctional activity of tempromandibular joint and muscle activity producing clenching types of activity with increase wear on posterior teeth and furthermore the increase chewing many produce greater wear on posterior teeth (whose function are to chew).

Interestingly too, was the finding that 'Ecstasy' abusers more frequently had extensive tooth wear (involving dentine or pulp) on posterior teeth (molars and premolars) compared to non-'Ecstasy' abusers. This was apparent on maxillary and mandibular posterior teeth and, right and left side posterior teeth. Although there was no difference in the extent of tooth wear among anterior teeth (canines and incisors) between 'Ecstasy' abusers and non-'Ecstasy' abusers.

The greater extent of tooth wear among the posterior teeth of 'Ecstasy' abusers compared to non-'Ecstasy' abusers may reflect the reported greater reported

parafunctional activity of 'Ecstasy' abusers (tooth grinding, tenderness of joint muscles, and chewing) compared to non-'Ecstasy' abusers which is likely to produce greater wear on posterior teeth.

6.5.3 Tooth wear index scores

Tooth wear index scores were relative high overall given the age of the project's study group.

7. CONCLUSIONS

- The drug abusers reported a wide range of oral health sensation after drug abuse, 'trips'.

- Drug abusers reported cravings for 'sugary food', drinking 'fizzy' drinks and chewing gum after drug abuse, indicating a pattern of oral health behaviour.

- Caries experiences was high among the drug addicts and a large proportion had untreated decay. In addition, the prevalence of tooth wear was high among the group, particularly on posterior teeth.

- 'Ecstasy' (MDMA) abusers more frequently reported grinding and clenching their teeth, chewing, pain/ tenderness in muscle and TMJ, and dryness in their mouth compared to non-ecstasy abusers after drug abuse ('trips').

- 'Ecstasy' (MDMA) abusers more frequently reported chewing gum after drug abuse compared to non-ecstasy abusers.

- Dental caries experience was higher among 'non-Ecstasy' abusers than 'Ecstasy' (MDMA) abusers. Tooth wear was more prevalent and severe among 'Ecstasy' (MDMA) abusers compared to 'non-Ecstasy' abusers.

8. RECOMMENDATIONS

- We recommend that drug addicts and the general public should be educated about the effects of drug abuse on oral health.

- Those promoting against drug abuse should be aware of the effects of drugs on oral health, so as to implement a common risk factor approach.

- And lastly, by a multisectorial approach, dentists have a role to play in promoting against drug abuse and also a role in treating addicts.

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11. APPENDIX

請完成以下不記名的問卷, 在適當的方格內填上 ✔ 號或有關答案

例子: 請問你今年幾多歲? 18歲 ***性別*** ❑ 男 ☑ 女

1. 請問你今年幾多歲? _____ 歲

2. 性別 ❑ 男 ❑ 女

3. 種族 ❑ 中國 ❑ 其他,請註明 _____

4. 你在最近三個月內有否因健康不良而需要葯物治療? ❑有 ❑沒有
   如有, 請列明有關疾病 _____

5. 請問曾否服用派對葯物如;
   (可撰擇多於一項)
   ❑ 搖頭丸 ❑ 藍精靈
   ❑ K 仔 ❑ 咳葯水
   ❑ 大麻 ❑ 天拿水
   ❑ 忽得 ❑ 其他,註明_____

(如從沒有服用派對葯物請無需回答以下問題)

6. 請問你由多少歲開始服用派對葯物? _____ 歲

7. 一般情況, 你平均服用派對葯物次數為多少?

❑ 多於一星期一次 ❑一星期一次
❑ 少於一星期一次,但多於一個月一次 ❑少於一個月一次

8. 請問你覺得派對葯物對你的牙齒，牙肉及口腔是否有影響呢? ❑有 ❑無

9. 服用派對葯物後你有否減少對口腔衛生的關注? ❑有 ❑無

10. 你有否曾因用派對葯物所引致的口腔問題而接受治療 ❑有 ❑無

11. 當你服用派對葯物後有否出現下列情況?

	服用時	服用後或之後
覺得口乾	❑有 ❑無	❑有 ❑無
覺得想□趙或咬東西	❑有 ❑無	❑有 ❑無
磨牙或咬緊牙齒	❑有 ❑無	❑有 ❑無
咬到舌, 唇或腮	❑有 ❑無	❑有 ❑無
覺得口腔麻痺	❑有 ❑無	❑有 ❑無
牙齒敏感	❑有 ❑無	❑有 ❑無
覺得牙骸或面部肌肉有痛楚	❑有 ❑無	❑有 ❑無
張開口時有困難	❑有 ❑無	❑有 ❑無
張開口時或進食時牙骸是否有聲	❑有 ❑無	❑有 ❑無
弄斷牙齒	❑有 ❑無	❑有 ❑無

12. 當你服用派對葯物後有否出現下列情況?

	服用時	服用後或之後
想食甜或含糖的食物	❑有 ❑無	❑有 ❑無
飲用汽水或紙包飲品	❑有 ❑無	❑有 ❑無
咀嚼香口膠	❑有 ❑無	❑有 ❑無

13. 你認為派對葯物對你的牙齒, 牙肉及口腔有沒有其他以上沒有提及的影響?
如有, 請註明.

_____

_____

_____

_____

_____

_____

完

Group 5.6

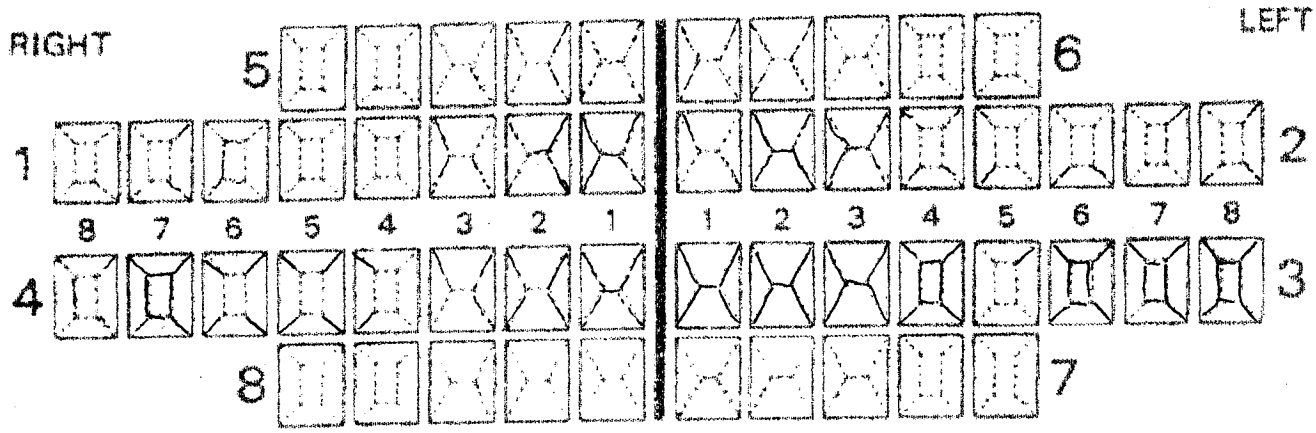
Data collecting form for TMJ examination

		Y	N
A) Sounds – clicking or crepitus			
B) Palpation of pain on TMJ			
C) Range of movement _____mm side to side ____mm			
D) Straight and symmetrical movement			
E) Muscle pain:	(i) Palpation (1) masseter		
	(2) temporalis		
	(ii) Resistance test		
F) Biting test:	Right side		
	Left side		

Trauma index

A) Hard tissue	**Y**	**N**
i) Tooth substance loss		
(Fracture) if yes: - Enamel only ____ - Dentine involved ____ - Pulpal exposure ____		
	Y	**N**
ii) **Missing teeth (due to trauma)**		
if yes, which tooth _____		
B) Soft tissue		
Ulcer	—	—
If yes, site: ____ size: ____ no: ____ **recurrency:** ____		
Petechiae:		
If yes, site____		
Bite marks:		
If yes, site____		
White Patches:		
If yes, site____		

DMFT



Tooth wear (TWI score)

	18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28
CERVICAL																
BUCCAL																
OCC./INC.																
LINGUAL																
	Right								Left							
LINGUAL																
OCC./INC.																
BUCCAL																
CERVICAL																
	48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38

Dentition Status

Total no. of sound teeth ___
Total no. of decayed teeth ___
Total no. of filled teeth ___
Total no. of missing teeth ___